

# Possible origin for oscillatory superconducting transition temperature in superconductor/ferromagnet multilayers

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## Abstract

We have studied superconducting and magnetic properties of sputtered Fe/Nb/Fe trilayers. For a fixed Nb thickness and with changing Fe thickness,  $d_{\text{Fe}}$ , a nonmonotonic behavior of the superconducting transition temperature  $T_c$  was observed with a maximum at  $d_{\text{Fe}} \approx 10 \text{ \AA}$ . The analysis of the magnetization data revealed that for  $d_{\text{Fe}} \leq 7 \text{ \AA}$  the Fe layer is nonmagnetic. The interpretation of the observed  $T_c$  behavior is attributed to the existence of this magnetically "dead" layer and the change of the interaction of the Cooper pairs with this layer at the onset of ferromagnetism for  $d_{\text{Fe}} \geq 7 \text{ \AA}$ .

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